

NextGen Housing

Chapter Study:

On flexible spaces and modularity

The standard house is built as a highly static and immovable object, but the people who occupy them are not. Families grow, shrink and change and so do the occupants and their needs. But to alter or renovate a house can be a cost prohibitive, time consuming and highly disruptive exercise. How can we design and construct houses more intelligently, houses that predict and allow for adaptability?

Jessica Hartany 104512111
Angelina Le 10449205

This chapter provides a chronological progression of Australian and international housing post World War II period to present condition, through a collection of case studies that analyses housing transformations and adaptability to change, their flexibility of space and modularity, in the ongoing battle of solving the issue of sustainability, affordability, and urban sprawl for the next generations.

Overview

1940s – 1950s: Post World War II

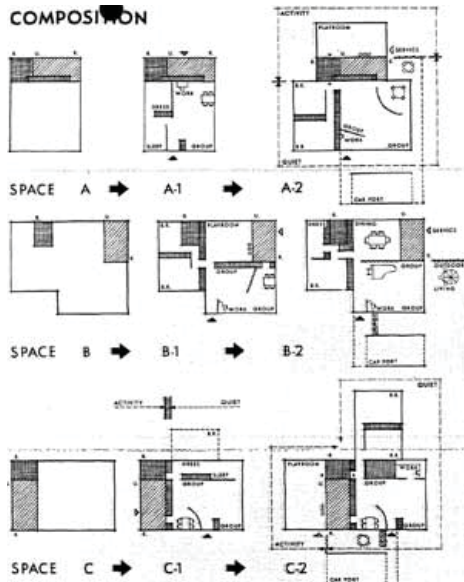
The 'baby boomers' period was marked by the rapid birth rate increase after 1945 which resulted in the housing boom that was fuelled with the pursuit of the great Australian dream. This sparked a significant phase of building and construction in Australia as home ownership rate increased from around 40 percent in 1947 to over 70 percent in 1960.

As population grew, also coupled with the enormous influx of new immigrants, housing supply could not keep up with demand. In 1946, it was estimated that 200,000 Australian families required homes and many existing homes needed rebuilding in order to create additional space.

The highly increasing demand for housing and a shortage of building materials and labour prompted the development of different methods of construction. Many dwellings were constructed using new, cheaper materials like concrete, fibro and corrugated iron roofing and prefabricated homes were imported from overseas. 'Prefabrication' means that the components of a house are built in a factory, and then moved to another location to be assembled.

1940s-1950s

Flexible Space, SOM, USA, 1942

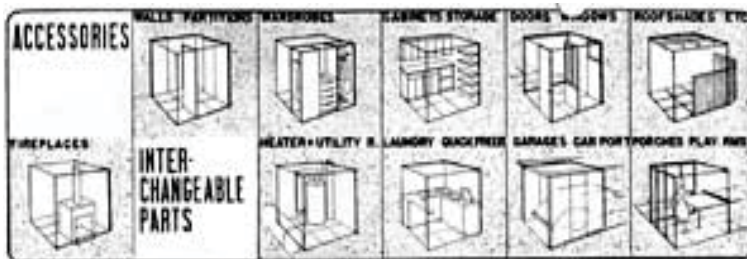


According to SOM, a basic housing unit consists of a Vocabulary (shell, utility units, wall units - exterior and interior, and mobile units - thing & body furniture), a Grammar (the functional relation of Vocabulary: shell + utilities = space) and Composition (the final expression in plan.)

Plans were developed with progressive change in mind, so that families could expand or contract and so that utilities could be replaced when obsolete.

References: Skidmore, L., N. A. Owings, and J. O. Merrill, 'The new house 194X ... : 12. Flexible Space', The Architectural Forum, 1942, pp. 100-03. Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

Prefabrication, Walter F Bogner, USA, 1942



Walter Bogner's proposal for this house comes in four divisions: groundwork, shell assembly, installations unit and accessories and interchangeable parts; it responds to a brief set which asked for a design that should be adaptable to different needs resulting from changes in family composition as the family grows older.

The shell assembly consists of the enclosing walls and a roof, with subdivisions measuring 8 feet - horizontally as well as vertically, which can be further subdivided into three parts - but without the need for interior support. The division within this shell is made with interchangeable panels, which can be solid or have a window, or can be external or internal. These accessories and parts are considered like furniture and can be bought at any time or rearranged periodically to suit changing family needs.

References: Bogner, W., 'The new house 194X ... : 4. Prefabrication', The Architectural Forum, 1942, pp. 78-81. Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

1940s-1950s

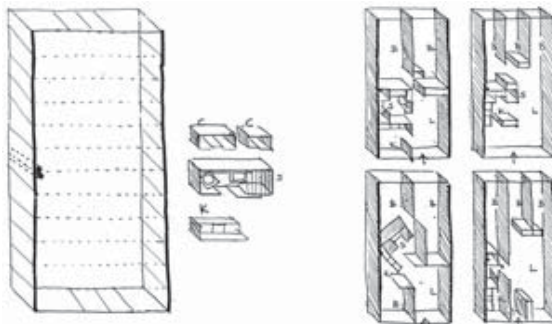
Monocrete Houses, Canberra, ACT, 1946



Following the struggle to obtain materials caused by post-World War II shortages, concrete walls were introduced from 1945 to counter the brick shortage. the government began experimenting with concrete construction, with a test concrete wall being added to a house in Turner. Beginning in 1946, 100 prefabricated monocrete houses were constructed in O'Connor and Turner and then in 1948 another 45 were proposed for Yarralumla with an improved design.

Reference: Cornerstone of the Capital. A history of public housing in Canberra / Bruce Wright, ACT Housing, 2000. Source: ACT Heritage Library - <http://www.images.act.gov.au/duslibrary/>

Movable Boxes, Yona Friedman, 1949

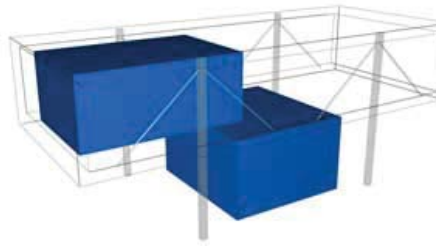


Based on Friedman's experiences during World War II, where two or more families had to share a single room that was commonly divided with furniture, this project is based on a shell whereby the interior layout of the home was left to the inhabitants to determine. The designed structure could be used to build houses of one or more floors and consisted of two party walls, two end walls with window and door openings, and a roof. All sanitary and kitchen units and closet partitions in the house were lightweight boxes that could be positioned by the inhabitant as desired.

Reference: Lebesque, S. and H. Fentener van Vlissingen, Yona Friedman. Structures serving the unpredictable, Rotterdam: NAI Publishers, 1999. Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

1940s-1950s

Rose House, Harry Seidler & Associates, NSW, 1950



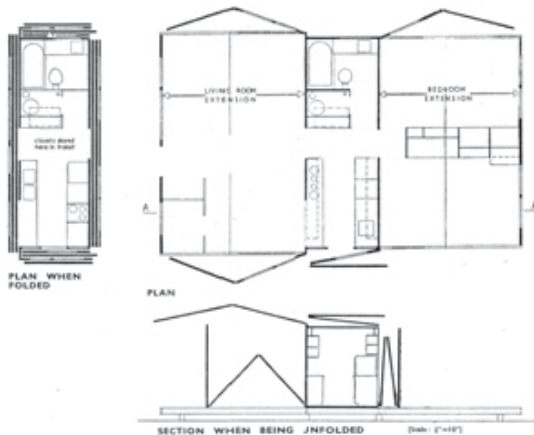
The 160 m² house is constructed with a minimal steel frame which stands on four columns, 10 meters by 8 meters apart. Diagonal hangers support the raised floor, which projects five metres at each end. Apart from the suspension members and columns the plan is free of loadbearing elements, allowing the plan to be adapted over time.

References: Frampton, K., and P. Drew, Harry Seidler : four decades of architecture, London: Thames and Hudson, 1992.

Richardson, J., 'Modern idol', Home & Building, 1998, pp. 52-57.

'Rose Seidler house, Wahroonga, New South Wales, Australia, 1950'. GA houses, 2002, pp. 48-55. Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

Prefabricated House, Carl Koch, USA, 1950



The house consists of a central core containing kitchen, bath, utility room, and all wiring, plumbing, heating and kitchen accessories. Panels that constitute walls, floor and roof of the rooms are hinged and folded against the core.

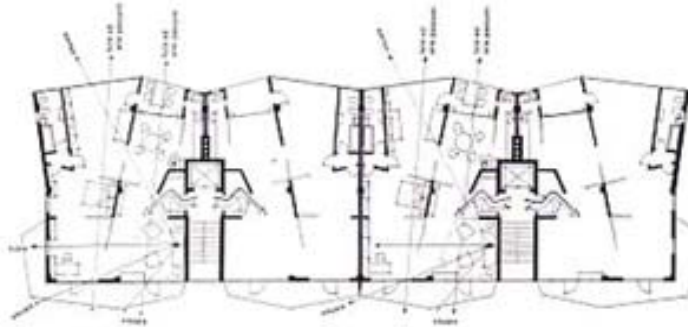
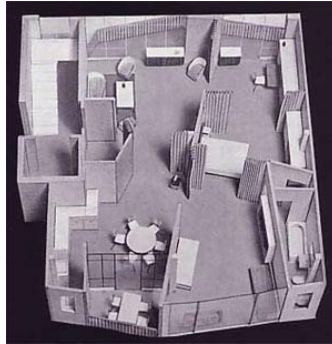
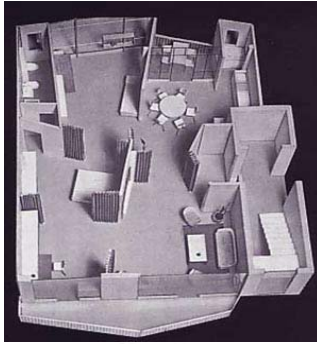
Once positioned on site, these panels are unfolded and bolted into position.

References: 'Prefabricated house in the USA', Architects' Journal, 1950, pp. 18-23.

Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

1940s-1950s

Single-Space House for Four People, Gio Ponti, Italy, 1957



This project develops the idea of a single space that is surrounded by the essential minimums of services - kitchens and bathrooms that are pushed to opposite sides of the single large space. A series of angles sections of wall provide the connecting point for concertina panels. These walls allow the creation of different connections between different areas and keep their multi-functionality intact.

The flexibility is one of use, heavily dependent upon its user to follow the directions given through the positioning of walls and moveable panels. Areas can be connected with each other as well as isolated, though never acoustically. The architect determined openness of the apartment has to be shared by each occupant. If applied, however, the various areas within the space create a set of special relationships both within the flat and with its surrounding.

References: Galfetti, G. G., Pisos Piloto - Model Apartments : Experimental domestic cells, Barcelona: Editorial Gustavo Gili, 1997. Galfetti, Gustau Gili, Pisos Piloto - Model Apartments : Experimental domestic cells (Barcelona: Editorial Gustavo Gili, 1997)

Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

1940s-1950s

1960s-1970s: Home expansion

As it continues through the 1960s, with the advancement of cheaper building technology, it meant that Australians could afford to pay for bigger homes. House expansion and additional improvements to existing dwellings became more frequent.

In this particular period, project homes also became increasingly popular with its mass-customisation and affordable template housing. The downside of this method is the lack of architectural planning that never lacks of criticism, as Robin Boyd refers in his book written in the 1960 as 'Australian ugliness'.

A more modern approach to architecture emerged in the 1960s, calling for homes that were more suited to the Australian climate and blended into the local environment. Home design entered a new phase of 'bringing the outdoors indoors', with a new emphasis on using natural light and a proliferation of patios and other outdoor living areas. The blurring of the inside/outside boundaries became prominent in house planning to give flexibility of space.

Further technological advancements also led to the growth of inner-city high-rise apartments and skyscrapers.

1960s-1970s

Lowline House, Pettit & Sevitt, VIC, 1963



The ideal of home ownership has for a long time been part of 'the Australian way'. By 1966 this ideal had become a reality for most with seventy per cent of Australians either owning or purchasing their home. Project builders played a significant role in helping them to realise the 'Great Australian Dream'. Unlike the traditional speculative, custom or order builder, project builders mass-produced houses, marketing them through models or displays as brand names.

Founded in Sydney in 1962, Pettit and Sevitt, like others, applied factory ('Fordist') principles to house construction. By standardising designs they reduced waste; by assembling portions of the houses off-site they could build faster on-site and, because they purchased materials in bulk, they were able to construct cheaper houses. But Pettit and Sevitt were also different. They targeted a small niche market - home buyers who sought, but could not afford, an architect-designed house. Typically draughtsmen designed project builders' houses, but Pettit and Sevitt employed architects.

Pettit and Sevitt incorporated design principles in their houses through simple lines, 'natural' features and an emphasis on functionalism. Because mass-produced, they were also able to offer the middle-class house purchaser an architect-designed house at a lower price.

The 'Lowline' designed by Ken Woolley and Michael Dysart, the company's first house and one of the most popular, was displayed at Sydney's North Rocks in 1963.

In 1966, Megan and Simon Sevant bought land in Mt Waverley, one of Melbourne's fastest growing suburbs, where the population increased twenty fold between 1945 and 1971.

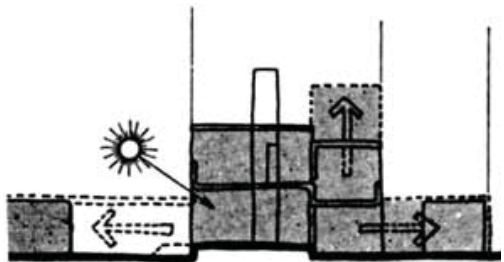
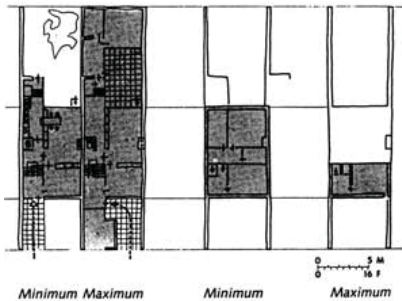
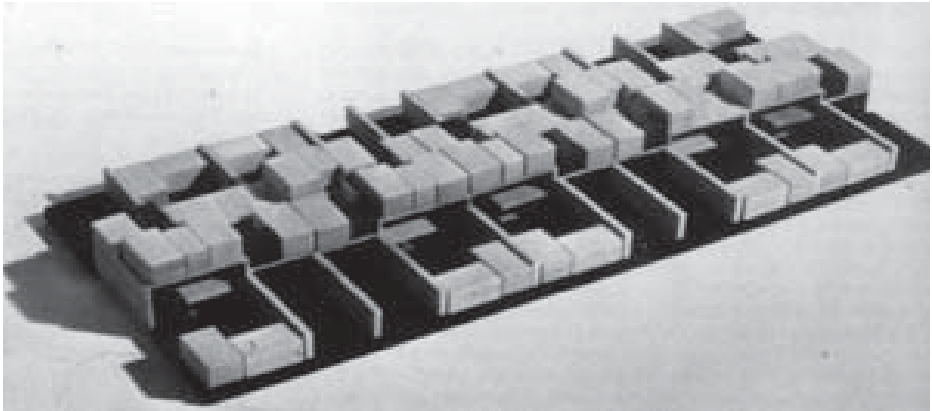
In 1967 Megan and Simon came across the Pettit and Sevitt Lowline display home. The architect-designed house was low in profile; the bricks were rough in texture, their edges tumbled rather than sharply wire cut, and the woodwork was stained in earthy colours rather than painted bright and glossy.

Changes were made to the plan, and an entrance hall incorporated, which was easy because like other project builders Pettit and Sevitt designed their houses in modules and they could be extended in modules of nine feet. Pettit and Sevitt's crews and tradesmen moved from house to house completing projects in a 'critical path', using the same principles as factory production and aiming to complete each house in the minimum time, usually about ten weeks.

Reference: Our house: histories of Australian homes, Mary Sheehan, Australian Heritage Commission, 2001. Source: <http://www.environment.gov.au/heritage/ahc/publications/commission/books/ourhouse/vic05.html>

1960s-1970s

Extendible houses, J.H. van den Broek, J.B. Bakema, The Netherlands, 1963



Van Broek and Bakema's project for extendible houses is an example of intentionally planning for future expansion, something often overlooked in normal housing design. On an elongated plot of land, the architects propose a narrow house not unlike a nineteenth century British terraced house. This core house contains a small front garden; it has a kitchen with direct access the back garden, and a combined dining and living room on the ground floor. The core house in its smallest state also has a second storey, which houses three rooms: a larger room to the front and two smaller rooms towards the back of the house.

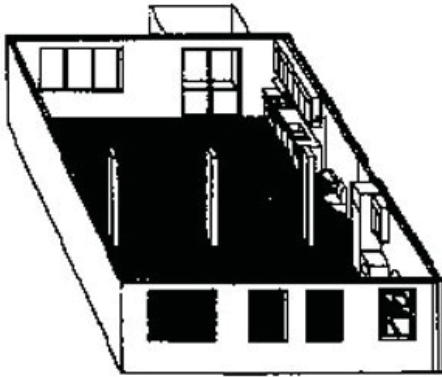
This smallest functional unit is designed to be expanded by pushing out horizontally to the front and back, and vertically upwards. Towards the front, on the site of the front yard, an additional room can be built, which might be a garage, a small shop or a guest room. Towards the back, the entire rear garden can be transformed into a series of rooms that are organised around a courtyard - which almost doubles the useable space on the ground floor. Finally, planning permission allows for an additional room to be built on top of the first floor flat roof. Together these changes allow for the initial house of 85 m² to be transformed into one of 130 m².

References

Bakema, A. v. d. B. e., *Architektur-Urbanismus*, Stuttgart: Karl Krämer Verlag, 1976.
Bakema, J. B., *Thoughts about architecture*, London: Academy Editions, 1981.

1960s-1970s

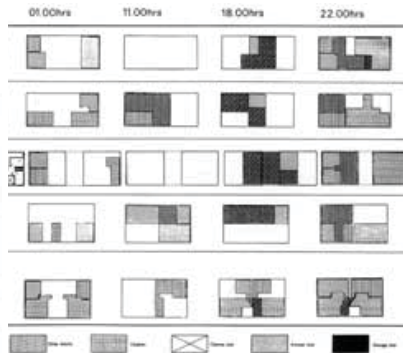
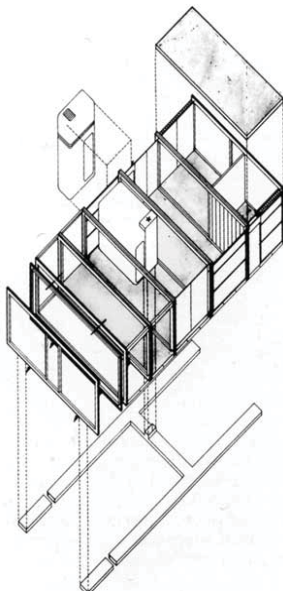
Diset - Flexible Apartment Units, Axel Grape, Sweden, 1964



The open plan of this building (2 dwelling units per flight of stairs: 60 & 90 m², or 90 & 120 m²) is only interrupted by intermediate columns. Services such as ventilation, water supply and drainage are arranged along the wall backing on the stairwell. The columns serve as space defining elements and as 'anchors' for movable cupboards and partitions.

References: Rabeneck, A., D. Sheppard, and P. Town, 'Housing flexibility?' Architectural Design, 43, 1973, pp. 698-727. Statens institut for byggnadsforskning, Flexible dwellings in blocks of flats: a study of an experimental block in Diset, Uppsala, Stockholm: Statens institut for byggnadsforskning, 1970, p. 168.

Steelhouse, Cedric Price, UK, 1967



Cedric Price designed the Steelhouse as a response to the increasing requirements for less definitive space. He argued that the main design criterion should be for the provision of space with maximum variation of possible uses. Features of the plan are: a shared activity area that is variable over a 24-hour cycle; alternative access routes (internal and external); capacity for subdivision into 2 homes; possibility of permanently fragmented 'home' with self-contained units and separate external access.

References: Price, C., Cedric Price, London: Architectural Association, 1984.

1960s-1970s

Building kit for summer houses, Kristian Gullichsen and Juhani Pallasma, Finland, 1971



Around 60 summer houses were designed and built using this building kit, which consists of horizontal, vertical and equipment components that can be arranged in numerous combinations.

References: Gullichsen, K., 'Massenproduktion, eine Illusion : Ein Sommerhaus für den Selbstbau', *werk, bauen + wohnen*, 1998, pp. 56-59.

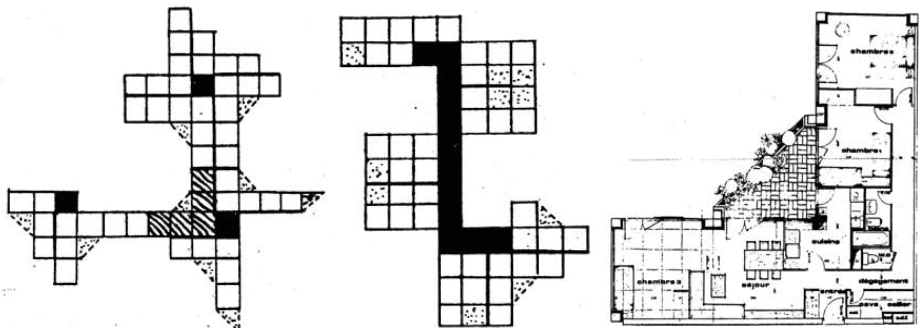
Frey Haus, Ernst Plischke, Austria, 1973



Large sliding screens open up or close down different parts of the building's ground floor, so that they can be used independently from each other or as one continuous space in order to meet changing requirements and circumstances. When open, each of the storey-high screens is contained within a fixed piece of wall, and, when closed, they always close against a wall or column.

References: Allison, P., 'Mobile elements in social housing in Austria', *ARCH+*, 134/135, 1996, pp. 104-05.

Combinatoires Urbaines, H. Maillard, France, 1975

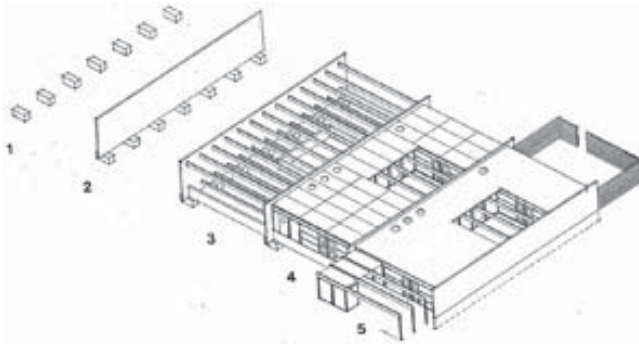


Any number of 4.5 x 4.5 m structural modules (partition planning module: 900 x 900 mm) can be connected to form one residential unit. These units can then be arranged along a linear corridor or multiple-loaded interior stairwells. Several forms of construction are possible; for a second project, the intent was for users to participate in the cluster-planning stage.

References: Rabeneck, A., D. Sheppard, and P. Town, 'Housing flexibility?' *Architectural Design*, 43, 1973, pp. 698-727.

1960s-1970s

Flexibo, Fællestegnestuen, Denmark, 1976



The sixty-eight one- and two-storey dwellings, designed by Fællestegnestuen for Copenhagen's Public Housing Association (KAB), were partially designed and often also partially built by the residents. Whilst the basic frame of the building, which consists of prefabricated components of concrete and laminated timber, cannot be altered (apart from adding smaller parts such as a pergola), the interior is based on a modular wall system, which can be changed, adjusted or reconfigured by a building's inhabitants.

The architects drawings clearly show the principle of layers in the design. Whilst flexibility in the Flexibo scheme is implemented at the project stage, it is also possible after occupation and when somebody else moves into the house. The construction system allows walls to be moved around very easily, so any layout can be adapted to different needs and requirements at any point in time. A study after 3 years of completion showed that various residents had changed the position of doors, added additional rooms and altered room sizes.

References: Duelund Mortensen, P., H. G. Welling, M. Livø, K. Utoft Christensen, and L. Wiell, 'Dwellings Defined by Situations - Dwellings Suitable for Changing Life Conditions', in *Housing in Europe: New Challenges and Innovations in Tomorrow's Cities*, Reykjavik, 2005.

'Flexibo, Amager : Arkitekter: Fællestegnestuen, with Viggo Møller-Jensen, Tyge Arnfred and Jørn Ole Sørensen.' *Arkitektur DK*, 23, 1979, pp. 232-39.

Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

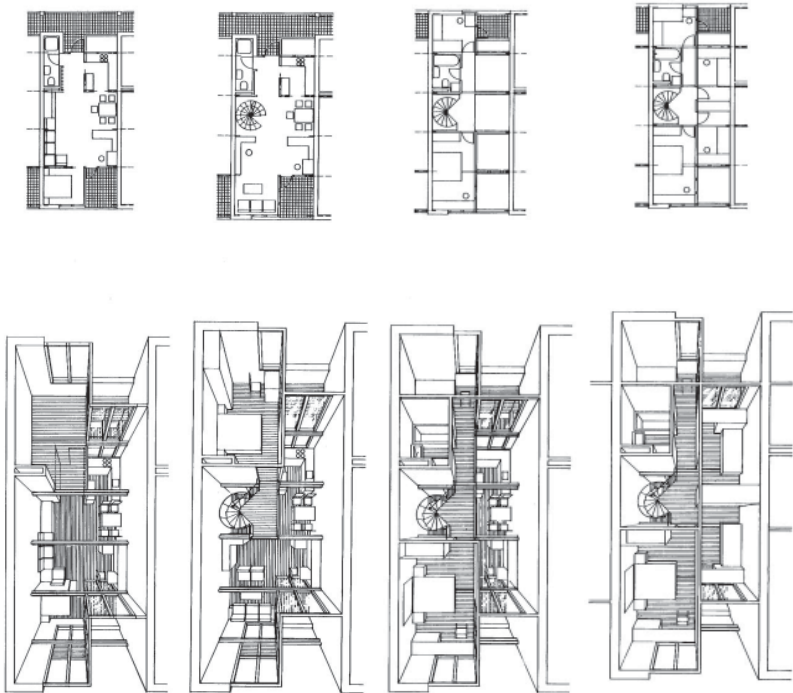
1960s-1970s

1980s-1990s: Renovation, Revitalisation & the Urban Sprawl

People moved to restore old, worn-out houses in previously slum areas to accomplish their great Australian dreams. This notion led to the establishment of cafés, delicatessens and other forms of street life which revitalised inner city suburbs with a new vibrancy and city areas eventually became more attractive places to live. With the population pushing to obtain home ownership, urban sprawl is unabated.

1980s-1990s

The Growing House, Anton Schweighofer, Germany, 1984



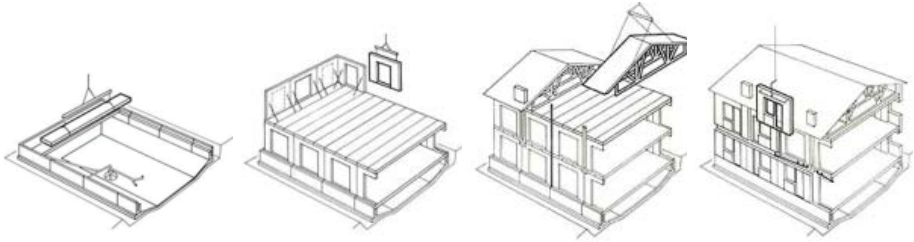
Schweighofer's work is characterised by the aim to develop spaces that are functionally as indetermined as possible. This is either achieved through the provision of a series of rooms that are individually accessible from a central hall or corridor but can also be interconnected with one another (see the earlier Wohnhaus of 1982), or it is achieved through the provision of excess raw space that can be completed by their users. This project for a multi-storey apartment house in Berlin proposes a set of apartments that can adapt over time: the initial double height space can be filled in with an additional platform to realise an additional storey. Over a period of time a one-storey double height one-bedroom apartment can be sequentially transformed into a two-storey four room maisonette. The future upper level is implied through beams at regular intervals. Onto these beams, floors can be laid so that a range of spatial arrangements - horizontally as well as vertically - are possible. A 49 m² apartment can therefore be changed into a space of 97 m², which can be used as an open loft space, a tightly built in conventional apartment on two levels or as a live and work combination.

The unit would be costly initially, both because of its relatively low site usage and also because one is paying for excess space in the first instance.

References: Kühn, C., ed., Anton Schweighofer: a quiet radical: buildings, projects, concepts, Wien: Springer, 2001

1980s-1990s

The Dynamic House, SKARNE Group, Sweden, 1990



The Dynamic House is a building system with a large degree of flexibility to facilitate future reconfiguration as needs change with time.

Basic factory-made components (concrete load-bearing external wall units + hollow-core concrete floor slabs) allow for total internal planning flexibility and convertibility. The installation of water, heat, ventilation and electricity is integrated with and part of the system. The electrical system is installed in one single operation once the floor covering and wallpapering work has been completed. If the room layout of the apartment is subsequently changed the electrical installations can be easily moved. Internal drainage pipes in the hollow-core floor slabs and in the cladding panels on the entrance side of the building are easily accessible.

Reference: Skarne, 'The Dynamic House' [Accessed 5 April 2005]

Hinged space, Steven Holl, Japan, 1991

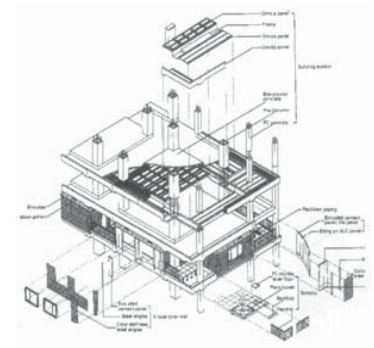


During the day, hinged panels and doors allow the expansion of the living area, which can be reclaimed as a bedroom at night.

References: Jacques, M., and A. Nève, eds., Steven Holl, Basel: arc en rêve centre d'architecture

1980s-1990s

Next 21, Osaka Gas with SHU-KO-SHA arch., Osaka, 1993



The NEXT21 project was initiated in order to test new models for reducing energy consumption and preserving the environment at the same time as creating apartments that suit and can adapt to individual residents' needs and lifestyles.

Building elements are divided into long-life elements that provide the communal structure and short-life elements in private areas which can be adjusted without disturbing the overall integrity of the system. Wall components are based on a modular system and can be placed anywhere on the predetermined grid. The services form a separate constructional layer. Wiring and piping for gas, water and electricity are located in raised floors or suspended ceilings.

Source: Flexible Housing - <http://www.afewthoughts.co.uk/>

Recording Studio + Living, USE Architects, 1995



This is a conversion of a Victorian warehouse floor into a live work unit, enabled by the wide-spanning floor construction with no internal loadbearing construction.

Reference: Field, M., 'Room at the top for acoustically sealed studio', Architects' Journal, 201, 1995. Mallett, L., 'A blob, a bed and 48 tracks; Architects: Jo Hagan, of Use Architects', Building Design, 1995, p. 15.

1980s-1990s

2000s-present: Urban sustainability and housing affordability

As Australia is facing a housing crisis, the need for a better sustainable and affordable urban housing escalates. With new innovations and increasing architectural involvements, the building industries attempt to produce better solutions in responding to social, economical and environmental changes.

2000s-present

Western Desert Semi-Transportables, WA, 2003

Over the past 8 years *indale poterson hook architects* have undertaken an ongoing series of projects for indigenous communities in the remote West Australian deserts. The research embodied in this work addresses the complex parameters of this neglected realm of architectural practice and attempts to engage with underlying issues of social equity and sustainability in a West Australian housing context. The projects deal primarily with an architecture of extremes, that is, the production of buildings that must respond to extremes of climate, extremes of remote distance and the challenge of extremes of cultural difference. The typical context of remote indigenous housing projects is that of a series of small

family based hamlets with populations of 50 to 120 people. The current housing stock on these communities ranges from *hampers and dachas* through poorly designed *lowcosted* style houses and concrete block *bunkers* of a design imported from the Northern Territory to several other more appropriate house designs.

In the remote housing designs by *indale poterson hook* there is no attempt to impart or represent any notions of *Aboriginality* other than through responding to the specificity of the challenging functional and cultural requirements of the brief. The following paper describes three of the projects, focusing particularly on the *Walmajarri Community Centre*.¹

WESTERN DESERT SEMI-TRANSPORTABLES *Mardu Country, East Pilbara, Western Australia*

The Western Desert is in the Pilbara Region of Western Australia, bounded by the Great Sandy Desert to the north, the Gibson Desert to the south and the rocky plateau of the Pilbara Craton where much of Australia's iron ore is mined. Summer temperatures range from 30 degrees Celsius at night to 55 degrees maximum in extreme events, while winter temperatures range from a minimum of minus 5 degrees to a maximum of 35 degrees.

indale poterson hook was commissioned by the WA Department of Housing and Works, Aboriginal Housing Infrastructure Directorate in 2003 to design a prototype semi-transportable houses for Western Desert Mardu Aboriginal Communities. The designs were driven by the need to provide radically different plan forms, while maintaining an approach to the component systems and materials that ensured that the buildings met the difficult challenge of being economic to build, transport and assemble on remote desert sites. The design approach also addressed the aspiration to

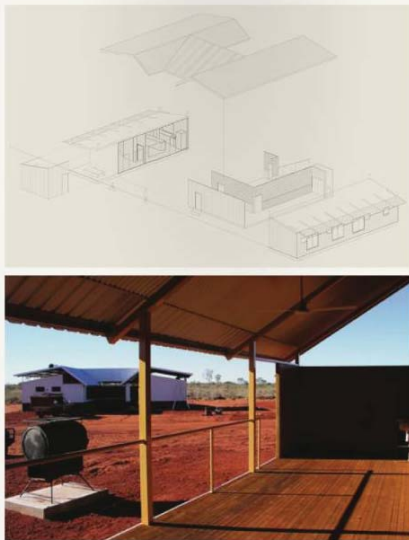
achieve qualitative outcomes for the community housing that exceeded the pragmatic requirements of the brief.

A population of up to 20 people often uses the infrastructure of the desert house. Each house is conceived as an *outdoor* house wrapped around an *indoor* house. This allows extended family members to live in and around the houses. Each house consists of two fully enclosed pavilions on a pre-stressed reinforced concrete slab, with insulated steel frame walls, lined with 9mm fiber-cement sheet internally and clad with corrugated Colorbond wall sheering externally. In-situ concrete has been replaced with steel pipe piles. The parasol roofs above the pavilions have the effect of dramatically reducing the heat loads on the living spaces to that of ambient air temperatures, and the concrete slabs provide a thermal link to the earth, stabilizing the temperature within the pavilions. The designs are now in their third generation, with some 17 houses being built in 6 communities.

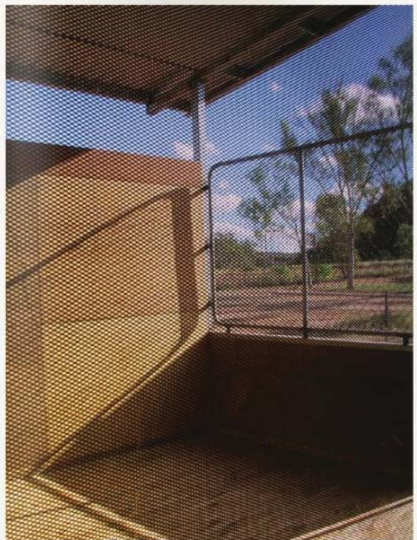


18

19



20



21

Source: Architectural Design Research - http://issuu.com/brentallpress/docs/adr_vol2_no1

2000s-present

Houses of the Future, NSW, 2004



WHAT FUTURISTIC POTENTIAL TO PARTICULAR MATERIALS HOLD? SIX ARCHITECTS UNDERTAKE AMBITIOUS PHYSICAL EXPERIMENTS IN CONCRETE, CARDBOARD, GLASS, TIMBER, STEEL AND CLAY.

REVIEW LAURA HARDING PHOTOGRAPHY BRETT BOARDMAN, JOHN GOLLINGS

INVENTIVE AND CONFIDENT speculation about the future characterized the Modern era. Exploiting technological breakthroughs and an emergent consumerist culture, Modernist architects developed case study houses, exhibition pavilions and prototypes that promoted new possibilities for living and captured the public imagination. The optimism and conviction that underpinned this exploration feel strangely distant to us today. In the fleeting and unstable climate of the so-called “digital age” we are preoccupied with the present. The future is confined to the realm of the digital, where it can be explored with impunity – free of the rigours of the “real” and the demands and delight of direct physical engagement.

In this context, participation in the Houses of the Future exhibition must have been an incredibly daunting prospect. Practitioners were asked to experiment ambitiously and physically, constrained by a brief demanding portability and “futuristic” expression and limited by sponsorship arrangements to exploration with a single material. Accordingly, you won’t find a paradigmatic or definitive statement about the Future House among the six pavilions that comprise the exhibition, but rather a series of propositions that, with varying emphasis, examine the role of technology, tectonics, affordability, ecology and typology in contemporary housing.

The major shortcoming of the exhibition is one mirrored in our existing housing stock – the irresistible appeal of the freestanding dwelling as the predominant housing typology. Declining land and resource availability demand that we address the failures of our existing housing types and learn how to live in greater proximity. This requires an assessment of the relationship between “public” and “private” spaces both within and between our dwellings. Most of the Future Houses rely on Modernist distinctions of served and servant spaces to structure their functions – concentrating bathing and sleeping in enclosed interior modules and unequivocally opening other spaces and functions in the houses to their surroundings and to each other. The Timber House is more extreme – locating its shared areas in the protected heart of the house and pushing private functions to its exposed edges. Such diagrams rely on an unpopulated buffer of private landscaped area surrounding the dwelling to function adequately – a luxury that will simply not be available to most houses in the future.

Source: Architectural Australia, January 2005 Issue - <http://www.archmedia.com.au/aa/aaissue.php?issueid=200501&article=7&typeon=2>

2000s-present

Smartshax, 2009

10 domain feb 20, 2003

domain.com.au



Designed by architect Ken Latona, Smart Shax are fast becoming an architectural genre of its own – the contemporary shax. But these shed-like structures are available off the shelf – all you need is a piece of land and planning permission. Upton says the main virtues of the building, designed as a weekender, are that it "connects you with the environment" and is ideal for remote locations – it comes with a composting toilet, rainwater tank and solar power.

"It's the complete package," he says. "If you have the block of land, then we'll come and put the kit on it [and build it]. You walk in and it's painted and everything."

Smart Shax have two bedrooms – one at each end of a living room/kitchen which opens wide to a deck – a bathroom and a separate toilet.

At 15 metres long and four metres wide, they are compact, light filled and elegant; little packages delivered to your door as "two truckloads", Upton says.

"The first one being all the frame and basically the lock up. The next one is all the finishes: the stainless steel kitchen benches, the gas fridge, the oven and the composting toilet."

The first Smart Shax were designed by Sydney-based Latona as holiday cabins at Wilsons Promontory in Victoria. He has built a name for himself designing environmentally sensitive holiday cabins, the most celebrated of which are his Cradle Huts, together with the lodge he designed, at the Bay of Fires on Tasmania's north-eastern coast. (Latona is also director of the company that leads the Cradle Huts and Freycinet Experience walks.)

Upton spent three years working for Latona and was responsible for the maintenance of the Cradle Huts. Now settled in Sydney, he saw the potential to market the Smart Shax at a competitive price.

If you have a block of land with town water, sewerage and electricity available, one will cost



Get your kit on: (above and left) Smart Shax.

you \$110,000 (plus GST and the cost of seeking planning approval). For remote areas the kit with toilet and solar power – is \$150,000 (plus GST and the cost of planning approval).

"The big cost of the Smart Shax is the composting toilet, the big opening doors and the solar stuff. They'll work well where people want to be a bit isolated," Upton says, adding that its open design is best suited to a coastal climate.

Next he plans to ask an architect to design a "squarer version" for cooler climes. "It'll be two storeys because that contains the heat. You have the decks and the openings, but you make the opening smaller and seal tightly."

Smart Shax, 9974 1344. www.smartshax.com.au



Source: <http://www.smartshax.com.au>

Prefab House, Happy Haus, Owen & Vokes, QLD, 2009



A prefab house designed by Brisbane firm Owen & Vokes has been installed on Brisbane's South Bank. Designed for Happy Haus, a firm that specialises in modular houses, the project is described as a "unique urban living experiment".

Called The White Series, this is the second series to be built by the company after Donovan Hill's DHAN range, launched in May 2009. Based around a central pod, the structure can be extended with rooms, outdoor spaces and additional common areas. Happy Haus founder Toby Lewis explained that the display offered consumers the chance to experience the prefab house first hand. As well as demonstrating the convenience and ease of prefab houses, the company aims to promote urban agriculture, with a low maintenance garden suited to inner-city living and consumers who have limited time and space for gardening. The display will "create a distinctly Australian, subtropical community house and garden," particularly suited to the Queensland climate.

Source: Architectural Review - <http://australiandesignreview.com/news/14640-Owen-Vokes-create-distinctly-Australian-prefab-house>

2000s-present

Prefab House, Andrew Maynard, VicUrban Affordable Home Design Competition, 2009



PREFAB HOUSE by Andrew Maynard being constructed. An Australian example of innovative methods of construction is the PREFAB HOUSE by Andrew Maynard. This reduces construction time from months to weeks and could be adapted to include broadband cabling and solar panels.

Source: <http://www.andrewmaynards.com.au/vic01>

Dangar Island House, Harper & Irvine, NSW, 2006



Dangar Island House is a lightweight structure with three pavilions on a slope. This home is elegantly designed and it uses an innovative modular building system.

It is a prototype of a prefabricated building system Harper developed in her work in remote communities in the Northern Territory in Australia. Harper and Irvine plan to apply the system to any house design, making it easier and more economical to build. The system uses steel modules or “picture frames”, as Harper calls them. These modules have a small braced upper area and a larger lower section that is equal in dimension to a standard panel of building material. “They are all designed around the building material size of 1200mm x 2400mm,” Irvine says.

The steel frames are bolted together in a skeleton structure. Then, as these frames are of standard dimensions, building materials such as plywood or fiber cement sheets, glass louvres, canvas or even a roller door, are slotted or screwed into the skeleton.

This system, because it's self-bracing, doesn't need any structural walls.”

The house could then be put together by laypeople with building savvy. Each frame weighs 80 kilograms so can be carried by two men.

Source: Sydney Morning Herald, the revolution will be modular – <http://www.smh.com.au> & http://www.mecando.com.au/assets/pdf/home_lifestyle.pdf

2000s-present

ANU Student Housing, ACT, 2009



A university accommodation block made entirely from prefabricated shipping containers has opened at Canberra's Australian National University (ANU). The project is the first large-scale application of container-architecture in Australia.

Designed by Australian company Quicksmart Homes, the project was completed six months after the materials were ordered. Following a modular design, the building is made from prefabricated shipping containers built in China and shipped to Australia, before being transported by road to the site in Canberra.

The six-storey Laurus Wing is an extension to the university's Ursula Hall, and features 70 units – a mix of one-bedroom apartments and studios – as well as additional spaces including a common room, laundry and bike storage. Each self-contained unit has individual bathroom and kitchen facilities, workspace with internet access, and a balcony.

Quicksmart describe their system as a “fusion of prefabricated construction, intermodal transportation and modern architecture,” with a flexible modular design that saves time on transportation and installation. Although the shipping containers are constructed new for the purpose – unlike many other green design ideas that reuse old containers – the company claims their buildings can halve construction times and save up to 20 per cent on the price of traditionally constructed buildings.

The modular system also means the building can be added to and refurbished. It can also be recycled – the building can be dismantled and reused in a different location.

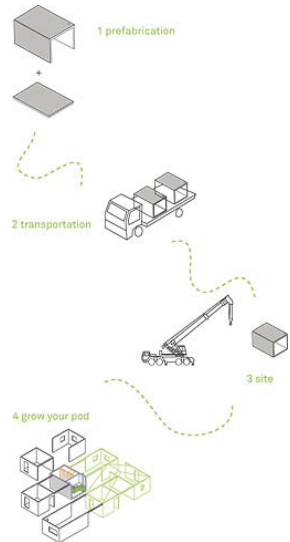
Quicksmart is now getting ready to begin the second stage of the university accommodation, which will provide a further 188 rooms.

Source: Architectural Review - <http://australiandesignreview.com/news/15565-Prefab-student-housing-made-from-shipping-containers>

Related website: <http://www.architectureanddesign.com.au/article/ANUs-modular-project-takes-shape/511909.aspx> & <http://www.quicksmarthomes.com/index.htm>

2000s-present

Regrowth Pod, 1:1 Architects, VIC, 2009



Victoria's "Black Saturday" bushfires in February 2009 killed nearly 200 people and destroyed more than 2000 houses. The fires created headlines around the world and mobilized many thousands of volunteers. What could architects do to contribute? Could they help facilitate community rebuilding in a timely, appropriate and sustainable way?

The team at 1:1 Architects were in a strong position to respond to this tragedy. They had previously demonstrated their capacity to provide prefabricated housing units for student accommodation at Charles Sturt University. These units can be understood in a similar vein to Mart de Jong's Spacebox pod designed in the Netherlands combined with the ruggedness of the Cargotecture units based on shipping containers designed by HyBrid in Seattle.

In a flurry of activity, Ben Edwards and his team reconfigured their design for student accommodation to create the re-Growth Pod – a robust prefabricated concrete structure that could be trucked to a site to become the core of a new house. The pod contains an internal sleeping space and a semi-enclosed kitchenette with a nifty overhead hinged door opening to the outside. Ablutions facilities (handbasin, pan, shower) are attached to the side of the pod, with all pipes precast into the concrete shell. Water pumps, gas tanks, a hot-water service and water storage tanks are also attached to the exterior.

Source: Architecture Australia, July 2009 Issue - <http://www.archmedia.com.au/aa/aaissue.php?is sueid=200907&article=3&typeon=1>

2000s-present

Where are we heading?

Faced with urban densification and climate change, it is therefore crucial for us to be aware and be constantly reminded that urban housing will never lack of social, environmental or economical issue and will undergo constant change.

Through the series of case studies, each urban housing project attempts to accomodate change and the progressions are evidently moving towards providing a better tomorrow for the next generations.

Robin Boyd made a strong point, project homes with their lack of architectural input are 'ugly' and perhaps not the the best solution, however we must keep in considerations that their success in providing a flexible and affordable solution for urban housing is valid. As designers, we must consider our architectural planning from all aspects. Designing flexibility and adaptability to accomodate change is certainly crucial in architectural planning. The opportunities are endless.

Looking Forward